paper[23] deals with the morphological nature of the so-called stem, which he calls "stock," the reason being that one of the questions is whether this tuberous axis represents only a short stem. After a presentation of the anatomical details, LANG concludes that the stock consists of an upwardly growing shoot region, and a downwardly growing region giving rise to the roots; the latter region he calls the rhizophore. He suggests that the origin of the rhizophore may hold some relation to the deep-seated secondary meristem at the base of the shoot, but that, once initiated, "the growing region of the rhizophore behaves like the primary axis which is congenitally sunken and inclosed." This region, it seems, is very suggestive of the basal root-bearing region of *Lepidodendron* and its allies, and confirms WILLIAMSON'S suggestion that *Isoetes* may be the nearest living representative of that paleozoic stock.—J. M. C.

Phylogeny of the Ascomycetes.—ATKINSON,[24] in a paper presented at the twenty-fifth anniversary celebration of the Missouri Botanical Garden, discusses at length the vexed question of the origin of the Ascomycetes and their interrelationships. In general his thesis is that the Ascomycetes have been derived from the Phycomycetes, rather than from the red algae, the possible transitions being suggested most strikingly by such a form as *Dipodascus*. The details of the argument are too numerous to cite here, but it is well sustained, and more convincing than any argument hitherto favoring the algal origin of the group. A chart presents in graphic form the conclusions as to interrelationships, the Protoascomycetes arising from the Phycomycetes, and in turn giving rise to the Euascomycetes through the *Dipodascus* "stock." The divergent lines of the Euascomycetes are represented as emerging from two primitive overlapping stocks (*Gymnoascus* and *Monascus*). The paper is a very important contribution to our knowledge of a perplexing group.—J. M. C.

Cecidology.—One of the latest American papers on cecidia is by FELT,[25] in which the author describes a very large number of species of midges, many of which cause galls, while others are more or less closely associated with galls. Although this paper is primarily entomological, it contains many descriptions of galls which are of value to the botanist.

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[23] LANG, WILLIAM H., Studies in the morphology of *Isoetes*. I. The general morphology of the stock of *Isoetes lacustris*. Mem. and Proc. Manchester Lit. and Phil. Soc. **59**: no. 3. pp. 28. 1915.

[24] ATKINSON, GEO. F., Phylogeny and relationships in the Ascomycetes. Annals Mo. Bot. Gard. **2**:315–376. *figs. 10.* 1915.

[25] FELT, E. P., A study of gall midges II. Itonidinae. Rep. N.Y. State Entomol. 1913. pp. 79–211.

In the recent European literature we find a very interesting article by CHRISTY,[26] in which the author describes a gall previously unrecorded for the British Isles. It reaches its full size of 2–10 inches in length by the middle or end of May. It is a malformation of the pistillate flower and has the appearance of a bunch of moss. The same or a very similar gall due to *Eriophyes triadiatus* Napela is well known on the Continent, but thus far the author has failed to find the mites in the British forms. It appears to be somewhat similar to our American *Acarus aenigma* Walsh.—MEL T. COOK.

Anthocyan pigments in plants.—In an examination of the recent work upon the occurrence and chemical nature of the red, purple, and blue plant pigments known as anthocyans, and yellow pigments designated flavones or flavonols, EVEREST[27] has summarized the present state of our knowledge in a very concise manner. He shows that it has been established that (1) the anthocyans always occur as glucosides, and that some seven of these pigments have now been isolated; (2) the same pigment may be capable of showing a blue, purple, or red color, according as it exists as alkali salt, free pigment, or oxonium salt of some acid; all anthocyans do not, however, form blue alkali salts; (3) the anthocyans may be obtained from flavonols by reduction followed by spontaneous dehydration; and (4) glucosides of flavonols can pass, by reduction, to glucoside anthocyans without intermediate hydrolysis.—GEO. D. FULLER.

Morphology of Gnetum.—THOMPSON[28] has published a preliminary note on the embryo sac conditions in *Gnetum*, several species of which he has investigated. There are no vegetative cells in the male gametophyte, which is the expected contrast with *Ephedra*. Only free nuclei occur in the embryo sac before the pollen tube enters, although cells are formed before fertilization takes place, and one or more eggs are definitely organized. Perhaps the most significant observation is that before fertilization the female gametophyte becomes divided into a large number of multinucleate compartments, all the nuclei in each compartment later uniting to form a fusion nucleus, the endosperm being formed by the division of the fusion nuclei in the lower compartments. This situation is certainly very suggestive of a historical relation to the polar fusion in the embryo sac of angiosperms.—J. M. C.

Origin of stipules.—The much debated question of the origin of stipules has received fresh light from the anatomical studies of SINNOTT and

[26] CHRISTY, MILLER, Witches brooms on British willows. Jour. Botany **53**: 97–102. 1915.

[27] EVEREST, ARTHUR E., Recent chemical investigations of the anthocyan pigments and their bearing upon the production of these pigments in plants. Jour. Genetics 45:361–367. 191.

[28] THOMPSON, W. P., Preliminary note on the morphology of *Gnetum*. Amer. Jour. Bot. **2**:161. 1915.